AMENDMENTS TO THE CLAIMS

Please amend claims as shown below.

1. (Currently Amended) Apparatus for carrying out a melting and casting operation in the fine casting art, in particular the dental art, comprising:

- a melting crucible for receiving melting charge,
- a heating device for heating the melting charge in the melting crucible, ~~and~~
- a pyrometer for ascertaining the temperature of the melting charge, the pyrometer adapted for use with different melting and casting materials,

and

~~whereby~~

- a control device for controlling the melting and casting operation in dependence on the ascertained melting charge temperature,
- wherein the control device has a database with a plurality of selectable, respectively melting charge material-specific parameter sets each with one or more parameters for configuring the pyrometer.

2. (Previously Presented) Apparatus as set forth in claim 1wherein each parameter set has one or more parameters for controlling the melting and casting operation in dependence on the melting charge material.

3. (Previously Presented) Apparatus as set forth in claim 1, wherein the control device has an input unit for the input of melting charge identification for the selection of a parameter set.

4. (Previously Presented) Apparatus as set forth in claim 3, wherein the pyrometer is a quotient pyrometer.

5. (Previously Presented) Apparatus as set forth in claim 4, wherein one or more sensors of the pyrometer can be directed by means of an optical system directly on to at least one partial region of the melting crucible.

6. (Previously Presented) Apparatus as set forth in claim 4, wherein the sensor or sensors of the pyrometer is/are connected to the connected optical system by way of an optical waveguide which can be directed on to at least one partial region of the melting crucible.

7. (Previously Presented) Apparatus as set forth in claim 6, wherein the control device has a communication interface for supplementing and/or updating the data base, parameter sets, parameters and/or control programs and/or for reading out protocols of a melting and casting operation and/or parameters.

8. (Previously Presented) Apparatus as set forth in claim 7, whereby associated with each melting charge identification is its own parameter set.

9. (Previously Presented) Apparatus as set forth in claim 7, whereby associated with a respective group of a plurality of melting charge identifications of a melting charge family, in particular an alloy family, having substantially identical or similar melting and casting properties, is an individual parameter set.

10. (Previously Presented) Apparatus as set forth in claim 9, wherein the heating device is adapted by the control device in such a way that a predetermined temperature of the molten material is kept substantially constant.

11. (Previously Presented) Apparatus as set forth in claim 10, wherein the heating device is controllable by the control device in such a way that the heating power of the heating device is reduced when a predetermined temperature of the molten material is reached.

12. (Previously Presented) Apparatus as set forth in claim 11, wherein the control device is so designed that it selects a parameter in dependence on the melting charge temperature pattern ascertained during a melting operation, in particular the ascertained solidus temperature and/or the ascertained liquidus temperature.

13. (Previously Presented) Apparatus as set forth in claim 12, wherein the control device is operable in a pyrometer calibration mode in which the control means sets calibration parameters for calibrating the pyrometer in dependence on the temperature pattern ascertained with a predetermined reference melting charge, in particular the solidus-liquidus temperature characteristic.

14. (Previously Presented) Apparatus as set forth in claim 13, wherein the control device is operable in a testing mode in which the control means checks the pyrometer on the basis of the temperature pattern ascertained with a predetermined reference melting charge, in particular the solidus-liquidus temperature characteristic.

15. (Previously Presented) Apparatus as set forth in claim 14, wherein the reference melting charge is a pure metal, in particular pure copper.

16. (Previously Presented) Apparatus as set forth in claim 15, wherein the control device controls the melting and casting operation in dependence on the presence or the absence of an auxiliary means which can be arranged in the region of the melting crucible, in particular a graphite insert, for assisting with the heating operation.

17. (Previously Presented) Apparatus as set forth in claim 16, wherein the ascertained melting charge temperature is reduced by a temperature difference value $T_{\ddot{U}}$ when the auxiliary means is present.

18. (Previously Presented) Apparatus as set forth in claim 17, wherein the temperature difference value $T_{\ddot{U}}$ is ascertained from the casting temperature T_G approximately in accordance with the following equation:

$$T_{\ddot{U}} = ((T_o - T_G)/(T_o - T_u))^* T_{const.}$$

wherein T_o is an upper temperature value in the range of between 1300°C and 1600°C, in particular 1400°C, T_u is a lower temperature value in the range of between 800°C and 1100°C, in particular 1000°C, and $T_{const.}$ is a temperature constant in the range of between 50°C and 250°C, in particular between 80°C and 180°C, in particular 100°C.

19. (Previously Presented) Apparatus as set forth in claim 18, wherein a given moment in time during the melting and casting operation is displaced by a compensating time duration t_V when the auxiliary means is present.

20. (Previously Presented) Apparatus as set forth in claim 19, wherein the compensating time duration t_V is ascertained from the casting temperature T_G approximately in accordance with the following equation:

$$t_V = ((T_o - T_G)/(T_o - T_u))^* t_{const.}$$

wherein T_o is an upper temperature value in the range of between 1300°C and 1600°C, in particular 1400°C, T_u is a lower temperature value in the range of between 800°C and 1100°C, in particular 1000°C, and $t_{const.}$ is a time constant in the range of between 10 seconds and 120 seconds, in particular 60 seconds.

21. (Withdrawn) A method of carrying out a melting and casting operation in the fine casting art, in particular the dental art, in particular with a casting apparatus as set forth in claim 20, including the following steps:

- introducing melting charge into a melting crucible,
- heating the melting charge by means of a heating device, and
- ascertaining the temperature of the melting charge by means of a pyrometer, whereby
- controlling the melting and casting operation in dependence on the ascertained melting charge temperature,

- wherein one of a plurality of melting charge material-specific parameter sets is selected from a database in dependence on the introduced melting charge and the pyrometer is configured by means of one or more parameters of the selected parameter set.

22. (Withdrawn) A method as set forth in claim 21, wherein the melting and casting operation is controlled by means of one or more material-specific parameters of the selected parameter set.

23. (Withdrawn) A method as set forth in claim 22, wherein a parameter set is selected on the basis of a melting charge identification inputted by means of an input unit.

24. (Withdrawn) A method as set forth in claim 23, wherein the temperature of the molten material is kept substantially constant at a predetermined temperature for a predetermined period of time.

25. (Withdrawn) A method as set forth in claim 24, wherein the heating power of the heating device is reduced when a predetermined temperature of the molten material is reached.

26. (Withdrawn) A method as set forth in claim 25, wherein a parameter set is selected on the basis of a melting charge temperature pattern ascertained during a melting operation, in particular the ascertained solidus temperature and/or the ascertained liquidus temperature.

27. (Withdrawn) A method as set forth in claim 25, wherein a melting operation is implemented with a reference melting charge and a temperature pattern, in particular the solidus-liquidus temperature characteristic, is ascertained and compared to a reference characteristic, stored in the database, of the reference melting charge and the pyrometer is calibrated and/or checked by means of the comparison result.